

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Canceled).

Claim 2 (Currently Amended): A communication system comprising:

a communication terminal device configured to ~~transmit data to~~ communicate with a mobile terminal ~~through a plurality of base stations;~~

a plurality of low order switching devices included in communication paths between the communication terminal device and the mobile terminal, said plurality of low order switching devices each configured to transmit packet data to a plurality of base stations and a plurality of secondary low order switching devices in a multicast manner, wherein each;

a high order switching device [[is]] configured to transmit packet data to the plurality of low order switching devices in a multicast manner to a plurality of devices connected to the switching device;

a first determiner[[,.]] configured to determine a transmission time for the high order switching device and each of the plurality of low order switching device devices to transmit the packet data resulting in simultaneous data reception at the mobile terminal,

wherein the determination is based on a time period necessary for transmission of the packet data from ~~one or more of~~ the high order switching device to each of the plurality of low order switching devices to one or more, and a transmission time from each of the plurality of low order switching devices to the plurality of base stations connected to each switching device and to one or more secondary switching devices at a mobile terminal side; [[and]]

a first transmitter[[,.]] configured to transmit the packet data from [[each]] the high order switching device to the plurality of low order switching devices, and from each of the

plurality of low order switching devices to the plurality of base stations ~~connected to the switching device~~, based on the transmission timing determined by the first determiner;

a first generator configured to generate a plurality of radio slot data, based on transmission target packet data,

wherein said transmission target packet data includes packet data transmitted to a ~~first the high order switching device that is the closest switching device to the communication terminal device among the plurality of switching devices in the communication paths~~, and based on the number of low order switching devices that are destinations of multicast transmission by the ~~first~~ high order switching device;

a second generator configured to generate packet data including the radio slot data generated by the first generator; and

a second transmitter configured to transmit ~~each of~~ the packet data including the radio slot data generated by the second generator to ~~[[a]]~~ the plurality of low order switching devices ~~connected to the first switching device~~, based on transmission timing determined by the first determiner ~~and associated with the first switching device~~.

Claim 3 (Currently Amended): A communication system comprising:

a communication terminal device configured to ~~transmit data to~~ communicate with a mobile terminal ~~through a plurality of base stations~~;

a plurality of low order switching devices included in communication paths between the communication terminal device and the mobile terminal, said plurality of low order switching devices each configured to transmit packet data to a plurality of base stations and a plurality of secondary low order switching devices in a multicast manner, ~~wherein each~~;

a high order switching device ~~[[is]]~~ configured to transmit packet data to the plurality of low order switching devices in a multicast manner ~~to a plurality of devices connected to the switching device;~~

a first determiner~~[[,]]~~ configured to determine a transmission time for the high order switching device and each of the plurality of low order switching device devices to transmit the packet data resulting in simultaneous data reception at the mobile terminal,

wherein the determination is based on a time period necessary for transmission of the packet data from ~~one or more of the high order switching device to each of the plurality of low order switching devices to one or more,~~ and a transmission time from each of the plurality of low order switching devices to the plurality of base stations connected to each switching device and to one or more secondary switching devices at a mobile terminal side;
[[and]]

a first transmitter~~[[,]]~~ configured to transmit the packet data from ~~[[each]]~~ the high order switching device to the plurality of low order switching devices, and from each of the plurality of low order switching devices to the plurality of base stations connected to the switching device; based on the transmission timing determined by the first determiner;

a second determiner configured to determine a reception timing, wherein each of the plurality of base stations, and each of ~~one or more second~~ the plurality of low order switching devices other than a first switching device receives the packet data simultaneously;

a difference information generator configured to generate information including a difference between ~~timing~~ a time at which each of the plurality of base stations received the packet data, ~~timing~~ and a time at which each of the ~~one or more of the second~~ plurality of low order switching devices received the packet data, and the reception timing determined by the second determiner; and

a second transmitter configured to transmit the packet data from the high order switching device to a predetermined low order switching device, and from the predetermined low order switching device to [[the]] a predetermined device base station based on the difference information and the second determiner at a predetermined transmission timing.

Claim 4 (Currently Amended): A communication system according to claim 3, further comprising:

a third transmitter configured to transmit transmission impossibility information from the predetermined low order switching device to a terminal side switching device that is a the high order switching device connected to the predetermined switching device at the communication terminal device side if the second transmitter cannot transmit the packet data to the predetermined ~~device~~ base station at the predetermined transmission timing; and

a fourth transmitter ~~in the terminal side switching device~~ configured to transmit the packet data from the high order switching device to the predetermined low order switching device at the predetermined transmission timing, based on the transmission impossibility information.

Claims 5 and 6 (Canceled).

Claim 7 (Currently Amended): A multicast switching device configured to transmit packet data ~~to a plurality of devices~~ in a multicast manner when a communication terminal device transmits data to a mobile terminal through a plurality of base stations, comprising:

a first determiner~~[[,]]~~ configured to determine a transmission time for the multicast switching device to transmit packet data resulting in simultaneous data reception at the mobile terminal,

wherein the determination is based on a time period necessary for multicast transmission of the packet data from one or more of ~~[[the]]~~ a plurality of low order switching devices to one or more base stations connected to each low order switching device and to one or more secondary low order switching devices at a mobile terminal side;

a first generator configured to generate a plurality of radio slot data, based on transmission target packet data,

wherein said transmission target packet data includes packet data transmitted to a ~~first~~ high order switching device ~~that is the closest switching device to the communication terminal device among the plurality of switching devices in the communication paths,~~ and based on ~~[[the]]~~ a number of low order switching devices that are destinations of multicast transmission by the ~~first~~ high order switching device;

a first transmitter, configured to transmit each of the transmission timings determined by the first determiner to the one or more base stations connected to each of the plurality of low order switching devices and to the one or more secondary low order switching device ~~devices corresponding to the transmission timing;~~ and

a second transmitter, configured to transmit the packet data to ~~a plurality of devices that are destinations of multicast transmission~~ the one or more base stations and to the one or more secondary low order switching devices, based on the transmission timing that is determined by the first determiner.

Claim 8 (Currently Amended): A multicast switching device ~~which transmits~~ configured to transmit packet data ~~to a plurality of devices~~ in a multicast manner when a communication terminal device transmits data to a mobile terminal through a plurality of base stations and which is a switching device closest to the communication terminal device ~~among a plurality of switching devices that are~~ included in communication paths between the

mobile terminal and the communication terminal device and execute the multicast transmission, comprising:

a first determiner configured to determine a transmission time for a high order switching device and each of a plurality of low order switching devices to transmit packet data resulting in simultaneous data reception at the mobile terminal ~~which, based on a time period necessary for transmission of the packet data to the plurality of base stations from each of one or more of the plurality of switching devices that is included in communication paths between the communication terminal device and the plurality of base stations and executes multicast transmission of the packet data, and based on a time period necessary for transmission of the packet data from each of one or more of the plurality of switching devices to one or more switching devices connected to the switching device at mobile terminal side, determines, for each switching device, transmission timing at which each switching device transmits the packet data to a plurality of devices connected to the switching device so that data reception timings at the mobile terminal become simultaneous among the plurality of base stations~~

wherein the determination is based on a time period necessary for transmission of packet data from the high order switching device to each of the plurality of low order switching devices, and a transmission time from each of the plurality of low order switching devices to the plurality of base stations;

a first transmitter ~~which transmits~~ configured to transmit each of the transmission timings determined by the first determiner to the switching device corresponding to the transmission timing;

a first generator ~~which generates~~ configured to generate a plurality of radio slot data, based on transmission target packet data that is packet data transmitted from the

communication terminal device, and based on the number of devices that are destinations of multicast transmission of the packet data;

a second generator ~~which generates~~ configured to generate packet data containing radio slot data generated by the first generator; and

a second transmitter ~~which transmits~~ configured to transmit ~~each of the packet data generated by the second generator to [[a]]~~ the high order switching device and to each of the plurality of low order switching devices that are destinations of multicast transmission, based on the transmission timing ~~that is determined by the first determiner and associated with the multicast switching device.~~

Claim 9 (Currently Amended): A multicast switching device according to claim 8, further comprising:

a second determiner ~~which, based on each transmission timing determined by the first determiner, determines~~ configured to determine a reception timing ~~indicating timing at which each of the plurality of base stations receives the packet data and reception timing indicating timing at which each of one or more of low order multicast transmission devices that are other switching devices than the switching device closest to the communication terminal device among~~ and each of the plurality of low order switching devices in the communication paths receives the packet data, so that data reception timings at the mobile terminal become simultaneous among the plurality of base stations;

an acquisition unit configured to acquire transmission impossibility information indicating that a predetermined ~~low order multicast~~ low order switching device cannot transmit packet data to a predetermined device at predetermined transmission timing for the predetermined device to receive the packet data at the reception timing which is determined by the second determiner, if there is a difference between at least one timing, among timing at

which each of the plurality of base stations received the packet data and timing at which each of ~~one or more of low order multicast~~ the plurality of low order switching devices received the packet data, and the reception timing determined by the second determiner, corresponding to the one timing, and when the predetermined ~~low order multicast~~ low order switching device acquires difference information from the predetermined device after the difference information indicating the difference is generated; and

a third transmitter which, based on the transmission impossibility information, transmits packet data to the predetermined ~~low order multicast~~ low order switching device at transmission timing for the predetermined ~~low order multicast~~ low order switching device to transmit the packet data to the predetermined device at the predetermined transmission timing.

Claim 10 (Currently Amended): A multicast switching device ~~which transmits~~ configured to transmit packet data ~~to a plurality of devices~~ in a multicast manner when a communication terminal device transmits data to a mobile terminal through a plurality of base stations and which is a switching device other than a switching device closest to the communication terminal device ~~among a plurality of switching devices that are included~~ in communication paths between the mobile terminal and the communication terminal device and execute the multicast transmission, comprising:

a first acquisition unit configured to acquire transmission timing of the packet data from a device which determines, for each of ~~[[the]]~~ a plurality of low order switching devices, transmission timing at which each of the plurality of low order switching devices transmits the packet data to a plurality of ~~devices~~ base stations connected to ~~[[the]]~~ each of the plurality of low order switching device so that data reception timings at the mobile terminal become simultaneous among the plurality of base stations;

a second acquisition unit configured to acquire generated packet data when ~~[[the]]~~ a high order switching device closest to the communication terminal device generates, based on transmission target packet data which is packet data transmitted from the communication terminal device and based on the number of devices which are destinations of multicast transmission by the high order switching device ~~closest to the communication terminal device~~, a plurality of radio slot data and packet data containing the generated radio slot data;

a generator ~~which generates~~ configured to generate a plurality of packet data containing radio slot data, based on the packet data acquired by the second acquisition unit and based on the number of devices that are destinations of multicast transmission; and

a first transmitter ~~which transmits~~ configured to transmit each of the packet data generated by the generator to ~~[[a]]~~ the plurality of low order switching devices that are destinations of multicast transmission, based on the transmission timing acquired by the first acquisition unit.

Claim 11 (Currently Amended): A multicast switching device according to claim 10, further comprising:

a third acquisition unit configured to acquire reception timing associated with the multicast switching device when the reception timing is determined so that data reception timings at the mobile terminal become simultaneous among the plurality of base stations, the reception timing indicating timing at which each of ~~one or more of the low order multicast~~ the plurality of low order switching devices, ~~other than the switching device closest to the communication terminal device among the plurality of switching devices in the communication paths~~, receives the packet data;

a difference information generator which, if there is a difference between timing at which the packet data was received and the reception timing acquired by the third acquisition unit, generates difference information indicating the difference;

a second transmitter ~~which transmits~~ configured to transmit the difference information to a switching device executing multicast transmission that is connected to the multicast switching device at communication terminal device side;

a fourth acquisition unit configured to acquire, ~~when a predetermined device acquires reception timing after the~~ reception timing indicating a timing at which the predetermined device receives the packet data ~~is determined~~ so that data reception timings at the mobile terminal become simultaneous among the plurality of base stations, and difference information indicating a difference between a timing at which the predetermined device received the packet data and the reception timing;

a third transmitter which, based on the difference information acquired by the fourth acquisition unit, transmits the packet data to the predetermined device at predetermined transmission timing for the predetermined device to receive the packet data at the reception timing; and

a fourth transmitter which, if the third transmitter cannot transmit the packet data to the predetermined device at the predetermined transmission timing, transmits transmission impossibility information to the switching device executing multicast transmission that is connected to the multicast switching device at the communication terminal device side.

Claims 12 and 13 (Canceled).

Claim 14 (Currently Amended): A communication method wherein a communication terminal device transmits data to a mobile terminal through a plurality of base stations, comprising:

~~a plurality of switching devices transmitting, via a high order switching device, packet data in a multicast manner to a [[a]] plurality of low order switching devices included in communication paths between the communication terminal device and the plurality of base stations;~~

transmitting the packet data in a multicast manner from the plurality of low order switching devices to ~~[[a]] the plurality of devices connected to the switching device base stations;~~

~~a first determiner, configured to determine determining a transmission time for the high order switching device and each of the plurality of low order switching device devices to transmit packet data resulting in simultaneous data reception at the mobile terminal,~~

~~wherein the determination is based on a time period necessary for transmission of the packet data from one or more of the plurality of switching devices to one or more base stations connected to each switching device and to one or more secondary switching devices at a mobile terminal side; and~~

~~determining a transmission time for each switching device to transmit transmitting packet data resulting in simultaneous data reception at the mobile terminal side transmitting the packet data to the plurality of devices connected to the switching device, based on the transmission timing determined by the determining [[step]]; and~~

generating a plurality of radio slot data, based on transmission target packet data, wherein said transmission target packet data includes packet data transmitted to a first switching device that is the closest switching device to the communication terminal device among the plurality of switching devices in the communication paths, and based on the

~~number of devices that are destinations of multicast transmission by the first switching device.~~

Claim 15 (Canceled).

Claim 16 (Currently Amended): The communication system according to claim 2, further comprising a third generator configured to generate packet data containing radio slot data based on the packet data transmitted to the low order switching device and the number of devices that are destinations of multicast transmission by the low order switching device;

Claim 17 (Currently Amended): The communication system according to claim ~~[[2]]~~ 16, further comprising a third transmitter configured to transmit the packet data generated by the third generator to a plurality of ~~devices~~ base stations connected to each of the second plurality of low order switching device devices, based on transmission timing determined by the first determiner ~~and associated with the second switching device.~~

Claim 18 (Currently Amended): The communication system according to claim ~~[[2]]~~ 17, wherein, each of the plurality of base stations transmits radio slot data contained in the packet data to the mobile terminal, and the mobile terminal generates the transmission target packet data, based on the radio slot data transmitted from each of the plurality of base stations.